Amendments to the Claims

1-3 (Cancelled)

4. (New) A method of determining the presence of radioactive nuclides having a long half-life in a sample, without chemical separation of radioactive nuclides having a short half-life from the sample, comprising:

detecting α-rays released from radioactive nuclides in a sample using an α-ray detector over a predetermined time period;

analyzing the detected α-rays by time interval analysis to identify the portion of α-rays released from radioactive nuclides having a short half-life;

subtracting the portion of α-rays released from radioactive nuclides having a short half-life from the detected α-rays to remove background α-rays from the detected α-rays; and

analyzing the remaining α-rays by pulse-height discrimination to determine the presence of radioactive nuclides having a long half-life.

5. (New) The method according to claim 4, wherein the α-ray detector detects α-rays as incident pulses and transmits such incident pulses as pulse data to a computer for time interval analysis.

6. (New) The method according to claim 5, wherein the computer analyzes the pulse data and plots a time distribution of the pulse data.